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The Chicken Mite.

BY JOHN J. REPP.

INTRODUCTION.

According to the twelfth census, Iowa led the states of the union in the number of chickens three months old and over, having June 1, 1900, 18,907,673. The value of poultry raised in 1899 was $9,491,818.00 and the value of eggs produced during that time $10,016,707.00. Allowing for the necessary incorrectness of such statistics it is still certain that we have in this state a vast poultry industry whose interests are deserving of our closest attention.

The mite attacks other species of domestic fowls besides the chicken, also at times becomes a serious pest to horses stabled with fowls or near them and even becomes parasitic upon man. This bulletin, however, deals only with the mite as it affects chickens, but the principles which it sets forth can be applied equally well in all conditions under which the mite exists.

BAD EFFECTS OF MITE INFESTATION.

One of the most formidable enemies of chickens in Iowa is unquestionably the chicken mite, scientifically called *Dermanyssus gallinae* Redi. My observations have demonstrated that chickens infested with mites are exceedingly unprofitable. The cost of keeping them is increased and the income from them is very much reduced. Indeed, when very badly infested they are totally incapacitated for performing work.

The hens will cease laying. The ovaries undergo atrophy and on autopsy will be found shrunken and in a condition unsuitable for work. In several flocks on which I made observation I found that egg production was greatly reduced or altogether prevented during the spring and summer when, under normal conditions, it would have been at is height.

Hatching hens will often either die on the nest as a result of the mite infestation or will leave their eggs, literally driven away by the vast hordes of mites which accumulate upon them. In case of three hens which thus died upon the nest in one flock of sixteen hens I could find no tissue change on post mortem examination which would account for death. There was, however, an anemia, or impoverished condition of the blood, such

as would be produced by the sucking of the blood by the mites. Following is an abstract from my autopsy record which will serve for all three cases:

Subject: Light Brahma hen found dead on the nest after sitting nearly three weeks. Skin and feathers swarming with mites. Also a few white lice, the *Menopon pallidum* Nitsch. Body in fair flesh. The digestive tract was almost empty; some oats in the crop; a small amount of hard, dry, feces in ceca. In each cecum were found about a dozen worms which I identified as the *Heterakis papillosa* Bloch, one of the round worms of the chicken, but those were not in sufficient number to exert any harmful effect. The blood was impoverished, a condition accounted for by the sucking of the blood by the mites. All the organs were normal so far as could be determined by the naked eye. Death could be accounted for only by the mite infestation.

Another very important feature of the evil effects of mites is the injury they do to newborn chicks. If the hen survives the ordeal to which she is subjected while hatching, the young chicks are attacked by the mites in great swarms as soon as they leave the protection of the shell, and, as a rule, the majority of them will succumb. I have known the loss of newborn chicks from this cause to reach ninety per cent.

Chickens, both old and young, will become reduced in flesh and lose the energy for hunting and scratching which is so necessary to their welfare. The feathers will become roughened and drop out, the head will become pale and the chicken in every way present an unthrifty and unhealthy appearance. Broilers which are being prepared for market will not thrive well and will turn out in the end to be unprofitable, in fact a loss to the owner. In addition to the sucking of blood the mites further reduce the vitality of the fowls by biting them and disturbing their rest at night. They require more food and are at the same time incapable of converting it into tissue and energy as would be done by a healthy fowl.

DESCRIPTION OF THE MITE.

The chicken mite is commonly considered a form of insect life, although it is not, properly speaking, an insect. It is sometimes called the chicken tick or poultry tick. It would probably be better to apply the term tick to this parasite and reserve the word mite for the true itch mite of chickens, the *Sarcoptes mutans* Robin and Lanquetin. The mite has an average length of one-twenty-fifth of an inch and its width is about four-fifths

of its length. It has eight legs by means of which it can move very rapidly from place to place. In color it is light gray with small dark spots showing through the skin. About one in fifty or one hundred shows a distinctly red color, varying from a light to a dark red. This red color is due to engorgement with blood. The common white louse of the hen, *Menopon pallidum* Nitsch, is longer than the mite and of a yellowish-white color. By the aid of Figures 1 and 2 one can easily identify the chicken mite even with the naked eye. Much aid will be given, however, by a hand magnifier.

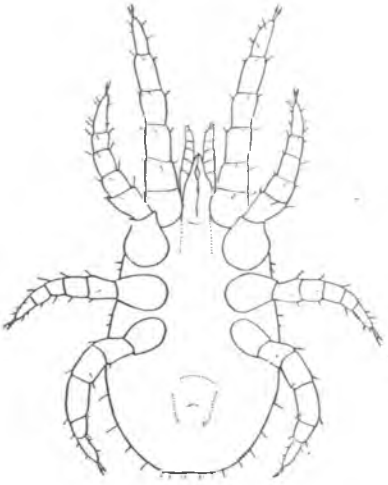

Fig. 1—Young mite, Ventral view. Magnified 70 diameters. Original.

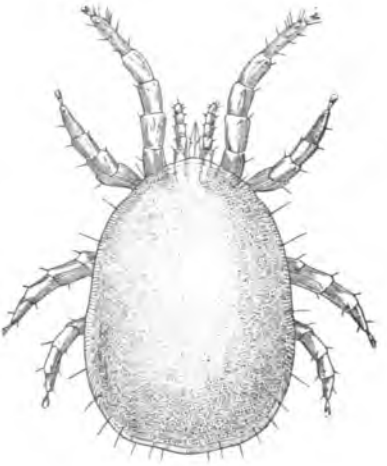

Fig. 2—Adult mite, Dorsal view. Magnified 50 diameters. Original.

The mites are of peculiar and stealthy habits of life, rather unlike that which one naturally expects from a parasite. Indeed they are only semi-parasitic, and, as a rule, remain upon the fowl only long enough to secure a meal. They are very active in their movements and seem to be ever on the lookout for a victim. On account of their vigorous and vicious habits they may be styled the wolves of the insect parasites of fowls. The mites hide in crevices and under objects in the henhouse during the daytime while the chickens are outside and lie in wait for their return. They lay their eggs and the young are hatched in these hiding-places. A barrel affords an excellent hiding- and breeding-place as the mites lodge between the staves and under the hoops. In the nests they are to be found under the straw or

other nesting material. It is a noteworthy fact that a place which shows only a few mites on the surface may contain vast numbers in the crevices or under objects. Often they become so plentiful that they overflow the hiding-places and appear in hordes upon the exposed surfaces. I have observed them so thickly settled as to cover the upper edge of an inch board and down the sides for a distance of two inches throughout four feet of its length and at the same time in almost as great numbers in neighboring places. On one occasion when the upper border of the nest box was covered by mites as above described a hen went upon the nest to lay. Within ten minutes I noticed that at least three-fourths of the mites had left their position on the box. On lifting off the hen and examining her I found her to be swarming with mites.

INTRODUCTION OF MITES INTO A FLOCK.

In one case I was able to determine with certainty that the mites were introduced into a flock by a rooster that had been bought in a neighboring flock which proved on examination to be badly infected with mites. There is no doubt that mites may be carried from one premises to another upon all sorts of intermediate bearers.

To provide against infection of a flock in this manner any new fowls which are brought in from infected premises should be quarantined and treated by dusting with pyrethrum powder until all the mites have been destroyed.

EXTERMINATION OF CHICKEN MITES.

In one case I tried to exterminate the mites in a henhouse by means of fire applied with a torch, but the attempt was unsuccessful. The flame was applied to the mites that were visible and they were destroyed. But the process was slow and care had to be taken so as not to set fire to the building. As soon as the interior had all been gone over once it was found that the mites covered it as thickly as before, they having crawled out from their hiding-places. It was necessary to go over it several times before the number appeared to appreciably diminished and in a few days they were as plentiful as ever. The application of the flame to all parts is a very slow process and is attended with some danger. It can not be directed into the crevices so as to destroy the eggs or the mites which are in hiding. My experience convinces me that it is impracticable to exterminate

mites by means of the flame. The only way in which fire could be made effective would be to burn the entire building.

I next resorted to the use of kerosene emulsion and found it very effective. The emulsion is made as follows:

Take one-half pound of hard soap and shave it into a gallon of *soft* water and put it on the fire and bring it to a boil. By this time the soap will have dissolved. Then remove the soap solution from the fire and stir into it at once, while hot, two gallons of kerosene. This make a thick creamy emulsion which is made ready for use by diluting with ten volumes of *soft* water and stirring well. It can be utilized as a spray, dip or wash.

It is necessary to use soft water, for hard water decomposes the soap and destroys its emulsifying power. In my experiments I used white laundry soap, but any good hard soap will do.

For the sake of brevity I refrain from recounting my various experiments, but will detail in a general way a method of applying the emulsion based upon my experimentation which will be found effective by those who will thoroughly try it.

Make up as much of the stock emulsion as it is thought will be needed. This can be kept in a suitable vessel and a portion taken out and diluted as needed. If the bucket or holder attached to the spray pump holds five gallons, one-half gallon of the stock emulsion should be taken and put into the bucket or holder and four and one-half gallons of soft water added and the whole well stirred. It is then ready to be sprayed on the places occupied by the mites. A beginning should be made at a particular place and the whole habitation of the mites sprayed in a regular order of which account should be taken so that the same order may be followed in subsequent sprayings. The spray should be directed with special care into all crevices, holes, joints, or other hiding- and breeding-places of the mites. The first spray of kerosene emulsion will kill within five minutes all of the mites and eggs with which it comes into contact, but many mites will be left in the hiding-places unaffected by the spray. Hence the spraying should be repeated as soon as the first spraying is completed. Even this will not kill all of the mites, hence a third spraying should be done as soon as the second is completed. At each repetition the beginning should be made at the same place and the same order followed as in the first. These three sprayings done in one day and in rapid succession will destroy nearly all of the mites, but, as my researches have shown, many eggs are left in places untouched by the spray. If mites are seen crawling about the building the next day, it should be sprayed

again. One might ordinarily suppose that he had now exterminated the mites. But such is not the case, for, in about three days, a crop of young mites will be found hatched from the eggs which escaped the first spraying. If these would be allowed to go undisturbed, it would not be long until the building would be as badly infested as at the beginning. Therefore the spraying should be repeated once every three or four days, spraying two or three times on each occasion, for about two weeks. The spray should be applied to every part of the building that is likely to contain the mites. In a two-story building they will crawl up the post and find lodgement upon the second floor even if chickens do not go there. In one case I found a colony of mites on the outside of a small door in the second story of stable in which chickens are kept and which was badly infested with mites. If such a lodging-place is overlooked, the mites will not be exterminated. The procedure just described will with very little doubt be effective in ridding a place of mites, but I would advise that a constant watch be kept and the spraying repeated when mites are seen at any subsequent time. It is not necessary nor advisable to exclude the chickens from their regular coop while the process of extermination is going on except while the spraying is in progress. If the chickens are deprived of their regular quarters, they will be compelled to select temporary quarters which will soon be as badly infested with mites as the old through multiplication of the mites which are carried upon the bodies of the fowls. If the chickens are not required to make a new roosting-place, the mites which are carried out by them will either drop off upon the ground and perish or will crawl off into the crevices about the roost and be killed by subsequent sprayings. Extermination of the mites may be hastened by dusting the fowls with pyrethrum powder after they have gone to roost on the evening before the first spraying. The powder will drive the mites from the birds, and, as a result, but very few will be carried out the next day upon their bodies. The powder is applied by means of a powder blower. In practice I have not found it necessary to use the powder, for, as already explained, the mites which were carried out upon the first morning were finally exterminated in other ways. However, if it is convenient to use the powder, the destruction of the mites will be facilitated.

In one case a sack of corn which had been sitting in a hen-house and was swarming with mites was removed to a distant building which was not occupied by fowls of any kind. No at-

tempt was made to destroy the mites, yet in two weeks they had all disappeared. Their death was doubtless due to the fact that they had no host upon which to feed. This observation leads to the supposition that if the fowls were kept away from a building infested with mites, the mites would entirely disappear within a few weeks. In practice, however, it would be inadvisable to attempt to get rid of the mites in a certain coop by keeping the fowls out of it and thus starving the mites, for, while the mites would thus be destroyed in the regular henhouse, the temporary roosting-place would likely soon be as badly infested as the old.

The cost of the remedy is very small. The cost of making thirty gallons of the emulsion is as follows:

Two gallons kerosene at 18c	36c.
One-half pound hard soap at 8c	4c.
Labor	5c.
Total	45c.

This will be enough to spray the ordinary farm henhouse once.

SPRAY PUMP.

In order to insure good results it is very important to have a spray pump which is durable and which acts easily and effectively. Such a pump should be obtained as may be turned to any one of the many farm uses to which a spray pump is adapted. While a very cheap pump may be made to serve in an imperfect manner, it will be found in the long run to be poor economy to try to save money by buying a cheap, poorly made pump. By investing $7.00 to $10.00 a desirable article may be obtained. While a copper holder costs more it lasts so much longer than tin as to fully repay its cost. The Bordeaux nozzle should be used. With it one can get a spray of any degree of fineness and the nozzle can be instantly adjusted so as to emit a forcible jet in order to throw the spraying fluid into fissures and holes. There are many good, reliable makes of spray pumps and different kinds may be seen in almost any implement store.

NOTE UPON THE DESTRUCTION OF MITE EGGS BY SPRAYING WITH KEROSENE EMULSION.

On July 11 a sugar barrel which was used as a nesting place by the hens and which was swarming with mites was sprayed with kerosene emulsion. Afterwards a hoop was removed and was found to be covered on the inside with a large number of

mite eggs. These eggs had been thoroughly moistened by the spray, and the mites upon the hoop had been killed. A piece of the hoop was cut out and placed under a glass dish. The air was kept moist by placing under the glass dish a smaller dish containing water. Other pieces of the hoop were left lying in an outbuilding so that they might be under conditions as nearly natural as possible. Observations were kept up until July 20th but the eggs failed to hatch and were at the end of this time shrunken and evidently in such a condition that subsequent hatching was impossible.

SUMMARY.

The chicken mite is one of the worst enemies of chickens in Iowa.

The mites live and breed in fissures about buildings and feed upon the fowls when they go upon the nest or perch.

Mites may be introduced into a flock by a fowl or other bearer brought from an infected premises.

Mites may be exterminated by thoroughly spraying the building and its contents with kerosene emulsion.

Kerosene emulsion kills not only the mites, but also their eggs, when it comes into contact with them.